

IN-HOUSE DESIGN & CHECKING PROCEDURES

The primary aim in both designing and checking is to produce a structure that will safely carry the anticipated loads.

The design team, consisting of the designers, checkers, and structural detailers, is responsible for developing a set of practical, clear, and concise design notes, plans, and specifications by the assigned due date with the allotted manpower.

The *BDM* provides standard details that are workable, serviceable, and reasonably economical. In addition, these details have been approved by FHWA for general use. Departure from these standards may result in delays caused by obtaining approval.

Designer

The designer's primary responsibilities include:

- Design concept and layout
- Structural design
- Preparing complete and legible calculations
- Producing a complete set of plans and specifications
- Resolving construction problems

The designer should advise and get concurrence from the Group Leader whenever deviating from approved office standards and practices.

The designer should inform the Group Leader of any areas of the design that should receive special attention during checking and review.

The designer's responsibilities also include the following project planning activities:

- Preparing a Design Time Estimate CPM Chart
 - Identifying tasks and planning order of work
 - Determining the number and titles of plan sheets
 - Coordinating plan sheet detailing
 - Coordinating computation of quantities
 - Preparing the Cost Estimate, Construction Schedule CPM Chart, and Special Provisions
- Any new or significantly modified Special Provisions shall be added to the X:drive SPB folder.

Design Checker

The primary purpose of a design check is to insure that the designer has not, through an error in mathematics, misunderstanding of the specifications, or other cause, produced an unsafe design.

The design checker's primary responsibilities include:

- Verifying the design theory and correct interpretation of the design code
- Accuracy and completeness of the design calculations to confirm the structural adequacy of the components
- Independent check of major controlling geometry

The design calculations should not be checked until the Situation Layout check is completed and any differences are resolved with the designer. If revisions are necessary, the designer should revise the design and details before the design checker proceeds.

The checker's design review comments shall be returned to the designer who will coordinate changes. When the design calculations are finalized, the checker should initial and date each page in the appropriate space.

For special designs or those done by inexperienced designers, the Group Leader may require a more complete design review by the design checker.

Plan Checker

The primary purpose of a plan check is to insure plans are constructible, consistent, clear, and complete. The check should include, but not be limited to, the following items:

Situation and Layout

- Make a complete check of the geometric layout
- Check the Typical Section for conformance to the roadway width and bridge railing curb-curb requirements
- Check the girder spacing and type, and slab thickness for conformance to the Typical Section and office standards

Major Component Details

- Verify that the details are in agreement with the approved design calculations

Structural Detailer

The structural detailer's primary responsibilities include:

- Preparing neat, correct, and easy to follow plan sheets conforming to current detailing standards
- Drawing details to scale
- Determining dimensions and elevations as required by the designer/checker
- Calculating quantities as directed

Group Leader

The Group Leader should work closely with the designer, design checker, and structural detailer during the design and plan preparation phases to help avoid major changes late in the design process.

The Group Leader's primary responsibilities include:

- Compatibility of design and details within the project
- Determining the level of checking required by considering the complexity of the structure and the skill of the designer
- Monitoring the design and detailing process and providing guidance and assistance as required
- Reviewing the design calculations for completeness and for agreement with office criteria and practices
- Reviewing the plans for completeness, constructibility, and agreement with office criteria and practices
- Reviewing the PS&E data for completeness and for agreement with office criteria and practices